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ABSTRACT

A project was conducted to improve and expand academic upgrading, job readiness, and special skill training for adults in the Keewatin Region through the implementation of computer-assisted learning (CAL). It was intended as a response to the special needs of unemployed Inuit who were not reached in the past by traditional training programs and methods. The presence of CAL increased the numbers of students in programs, resulted in better student retention rates, and caused more registrations by employed persons in special work-related CAL courses. Improved student work attitudes were attributed to some degree to CAL. Acquisition of greater academic skills and credentials was regarded as prima facie evidence of greater employability. Interviews and questionnaires administered to students and staff indicated strong support for CAL as a component of upgrading, as a tool for enhancing computer literacy, and for specialized applications. Both adult educators and students identified needs for courseware development. The project was evaluated as being a successful example of the use of technology to overcome barriers to access for adults learning in Canada's remote areas. (YLB)

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Preliminary Final Report:

Keewatin Region Educational Authority

Pilot Education Project

Computer-Assisted Learning

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INTRODUCTION

This is a summary report of the first year of a two year Computer Assisted Learning (CAL) Project being carried out with Inuit adult students in the Keewatin Region of the Northwest Territories.

BACKGROUND

The Keewatin Region is located on the eastern edge of the Northwest Territories, and comprises seven hamlets, or communities. Four of these hamlets, Arviat (formerly Eskimo Point), Whale Cove, Rankin Inlet and Chesterfield Inlet are situated on the west coast of Hudson Bay, directly north of the province of Manitoba. Baker Lake is about 200 miles inland from Chesterfield Inlet; Coral Harbour is located on South Hampton Island, and Repulse Bay on the Melville Peninsular. These isolated Communities can be reached only by plane, except for a short period in the summer when they can also be reached by boat. These seven communities' populations range in size from 190 (Whale Cove) to nearly 1,500 (Rankin Inlet). The Inuit population of these communities ranges from 77% in Rankin Inlet to 99% in Chesterfield Inlet.

The first language in the region is Inuktitut, of which there are many dialects. The functional literacy level in the English language is reached by about 23% of the population. There has been some form of adult education in the Keewatin Region for more than fifty years, beginning at the Catholic Missions, where adults were taught to read the bible, and continuing with informal training by community organizations. The Northwest Territories Department of Education established adult education centres in three communities in the 1970s; by 1987, there was an adult education centre in each community in the region.

Poster presentation, Sixth Canadian Symposium on Instructional Technology, Halifax, Canada, May 3 - 5, 1989.

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As the communities moved from a traditional land-based economy (hunting, fishing) to a more wage-based economy, a demand for different marketable skills emerged. Students who saw little value in education when they were in school as children and adolescents found that they needed to be at least functionally literate in English to be employable as adults in this economy. They needed specific training for some jobs, and the language of that training was usually English.

PROJECT OBJECTIVES

The objective of this project was to conduct a pilot project in Computer-Assisted Learning (CAL) that would allow:

a) adults who have not succeeded in traditional education programs to work independently at their own level and receive regular constructive feedback; and

b) adults requiring specialized training to get it in their community, improving their chances either of getting employment or of raising their level of employment.

PROJECT GOALS

1. To improve and expand, through the implementation of Computer-Assisted Learning (CAL), academic upgrading, job readiness and special skill training for adults in the Keewatin Region. To respond to the special needs of unemployed Inuit who were not reached in the past by traditional training programs and methods.

2. To provide specialized skills training not usually available in small communities to unemployed Inuit and other members of the community. (Special attention was to be paid to areas of training where local employment was available.)

FUNDING

The Canada Employment and Immigration Innovations Program provided funding in the amount of $1.285 million over two years (1987 to 1989) for computer hardware, educational software, development of Inuktitut courseware, contract instructors, furniture, administrative support and external evaluation. The Department of Advanced Education, Government of the Northwest Territories, provided the equivalent dollar amount in person years, facilities and program operation and maintenance costs.

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EQUIPMENT

Computer systems supplied by Control Data Canada were installed in the 7 Keewatin communities in August, 1987. The systems consisted of a Local Area Network (LAN) of either 5 or 8 computer terminal workstations, a 140 megabyte file server, printer, and a communications modem.

At the beginning of the second year (September, 1988), the number of computers was increased to 10 to 12 in each community.

The PLATO package consisted of Basic Skills, and High School Skills (GED) curricula. PLATO was used up to three hours daily by students as part of the adult basic education (ABE) program; business applications (chiefly databases, word processing and spreadsheets) were also used extensively.

ANTICIPATED RESULTS

The "anticipated results" in the original proposal for the Innovations Project were as follows:

a) Attracting and maintaining interest of a greater segment of the target population in educational programs.
b) Producing faster progress in academic training.
c) Providing job readiness skills.
d) Increasing chances of getting employment or improving level of employment.
e) The creation of a new more effective educational model for Inuit students which might be used through the Arctic.

FINDINGS

In year 1 (1987-88) of the project, the following findings were recorded:

1. Attracting and maintaining the interest of a greater segment of the target population.

The presence of CAL increased, sometimes dramatically, the numbers of students in programs, especially in evening programs, and enrollments by employed persons and others who would not normally have been accommodated in regular full-time programming. Also, one community (Chesterfield Inlet), which had not been able to sustain interest in traditional programs in recent years, was successful in the first year of this project in attracting and maintaining students because, in the opinion of the adult educator, of the presence of CAL.

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On a daily basis attendance rates were about the same as in previous years in the Keewatin; however, given the fact that, compared with Kitikmeot region students, the Keewatin programs were attracting more students and students with more varied backgrounds (as described below), the fact that there was no difference in attendance rates may be taken as an indication of the power of CAL to maintain students' interest. [The Kitikmeot is a region of the Arctic to the west and north of the Keewatin, comprising the communities of Cambridge Bay, Spence Bay, Coppermine, Gjoa Haven, Holman Island, and Pelly Bay. The Kitikmeot served as a control region in this study.]

Regarding client characteristics, the following differences were noted: Keewatin students were older, academically higher (as measured by the TABE and average levels of previous education), had more recent work history, and were more often parents and spouses compared with Kitikmeot students.

Overall, the adult educators reported increased interest in the Adult Education Centres in the communities in the Keewatin region, better student retention rates, and more registrations by employed persons in special work-related CAL courses, as evidence that CAL had helped achieve this objective.

2. Producing faster progress in academic training.

Because of its familiarity to students and staff, and its historically wide-spread use in the Northwest Territories, the Tests of Adult Basic Education (TABE) (1976 version) were used to assess the speed and magnitude of academic progress. The TABE tests skills in reading, math and language, with scores in Vocabulary and Comprehension, Computation Concepts and Problem Solving, and Spelling and Mechanics. There is no written composition component.

TABE results showed average grade equivalency gains of 0.63 and 0.92 grade levels after 3 and 6 months, respectively, for 26 Keewatin students for whom 3 sets of tests (pretest, posttest 1 and posttest 2) were available. A comparison of the pretest grade equivalency average (6.5) with the April, 1988, posttest grade equivalency average (7.9) showed an increase of 1.4 grade levels. Data from the previous year in the Keewatin region showed an average increase of 0.8 grade levels, and results from the Kitikmeot region for the 1987/88 year indicated an average gain of 1.2 grade levels. No correlation was found between time spent in the program and gains in grade equivalency level for either the Keewatin CAL group or the Kitikmeot controls.

A large majority of both the adult educators and students in the Keewatin region attested to the efficacy of CAL as a learning enhancer. Specifically, self-pacing, privacy of results, freedom

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of choice, and the availability of various specialized subjects (word processing, database, and spreadsheets, as well as advanced academic subjects such as math and science, and job search skills) were cited. Motivation was also increased by CAL, as was self-confidence in learning ability. Learning by CAL was perceived as prestigious and more effective by participants and the community at large.

Overall, the conclusion was reached that while CAL did not result in a major difference in rate or magnitude of learning gains as measured by TABE, it did contribute to significant increases in enrollment, enrollment of a wider variety of students, notably better success in communities where previous adult education programs had failed or had done poorly, improved retention of students, and a greatly improved self-image for participants, and a better image for adult education in the participating communities.

3. Providing job readiness skills

Students gained computer-literacy skills as a by-product of their use of CAL, and some students who pursued specialized training (word processing, database, spreadsheets and advanced topics such as higher math, physics and chemistry) also gained specific technical skills. Most users appeared to develop enhanced self-confidence and reduced reservations about computers as tools in daily life and employment. Many students reported their intention to pursue further technical training in the computer field.

Student attitudes were affected by the total adult learning experience, including but not limited to CAL: relations with supervisors, awareness of the job market, ability and willingness to seek employment, economic responsibility, family support, and cooperativeness were all rated higher on a pre/post measurement scale after completion of the program. Students and adult educators attributed some of these changes to experiences made possible by the presence of CAL.

4. Increasing chances of getting employment or improving level of employment

Acquisition of greater academic skills and credentials was regarded as prima facie evidence of greater employability. In addition, students' attitudes and plans were surveyed with a variety of instruments to show their specific intentions regarding employment: these proved to be very firmly oriented towards full-time jobs in the students' present communities, chiefly in trade and clerical positions. Expected starting salaries seemed

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to be within reasonable limits. As well, some adult educators recounted cases where employers who knew of the computer element in the adult education program contacted the Centre seeking computer-literate, trainable employees. There were numerous cases of employed persons who formerly would not have accessed the Centre enrolling in computer-based academic upgrading and other training related to their jobs, thus increasing their promotability and potential level of employment. [Long-term follow-up of students will indicate whether these initial trends persisted after the project.]

5. Creation of a new, more effective educational model for Inuit students which might be used throughout the Arctic

Interviews and questionnaires administered to students and staff indicated strong support for CAL both as a component of upgrading, and as a tool for enhancing computer-literacy, and for specialized applications (word processing, data base and spreadsheets). Both adult educators and students appeared to adapt successfully to this innovation, though technical problems in some communities impeded early adoption to some extent. The adult educators reported adjustments in their role as instructors, chiefly due to a reduction in routine clerical, recordkeeping and instructional demands, and increased time and opportunities for individual and small group student interaction. In general, the difference was regarded by the educators more as a change in tasks and operations rather than as a true change in role.

As they became familiar with CAL's potential, both the adult educators and the students identified needs for courseware development. Topics for development included both supplements to existing materials, and new materials, especially in the areas of native language and culture. The adult educators requested that they be permitted to participate closely in the design and development of these materials. In the second year of the project, development and pilot testing of these types of materials was planned.

In sum, this project showed some of both the problems and exciting potentials of CAL in the North. Where it was most successful, CAL and the availability of the related sophisticated hardware and telecommunications equipment produced notable attitudinal and behavioral results and effects. Where it was less successful causes were most often related to technical failure or unrealistic expectations. Throughout the project, the incidence of these latter declined. Overall, the project has come to be seen as a successful example of the use of technology to overcome barriers to access for adults learning in Canada's remote areas.